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GSA BBEST & Brazos River BBEST

<http://www.cowpokes.com>



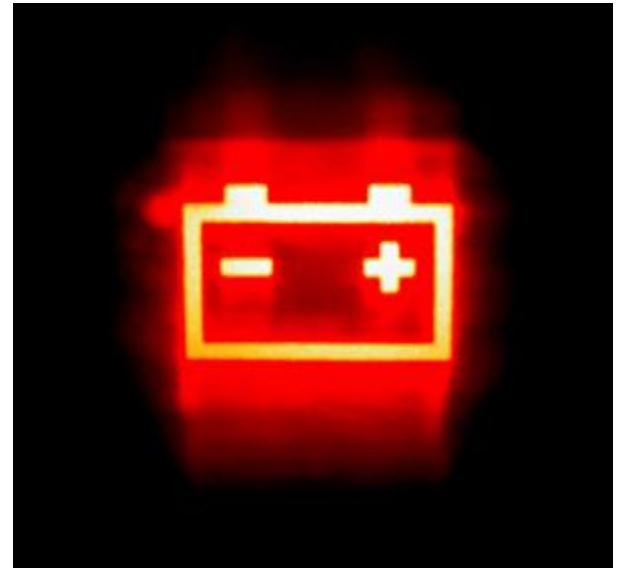
Problem: Truck will not start

Actions

- Approach 1 (Beginner's approach)
 - Attempt to understand structure and function
 - Dismantle and understand engine, transmission, structural design
 - Discover purpose of bumper, lights, seatbelt
- *All very useful information, but it is not the most efficient route to starting and using the truck

Actions

- Approach 2 (An Amateur's Approach)



*A more direct route to solving the problem

GSA Work Plan

- The “problem”: Developing a work plan
 - Establish a periodic review
 - Prescribe specific monitoring, studies, and activities (for what purpose?)
 - ...for continuing the validation or refinement of the e-flow regime recommendation

Actions

- Approach 1
 - Attempt to understand structure and function of the basin and bays
 - Reduce into small parts to understand how each component works
 - Discover new information about stream fish, mussels, oysters, and blue crabs

*All very useful information, but it is not the most efficient route to “validating and refining e-flow recommendations”.

Actions

- Approach 2

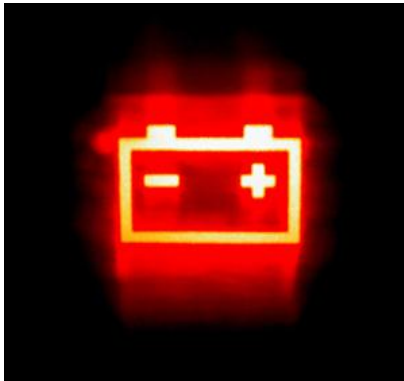


Table 4.1-15. GSA BBASC Environmental Flow Regime Recommendation - Guadalupe River at Cuero⁴⁹

Overbank Flows	Qp: 45,400 cfs with Average Frequency 1 per 5 years Regressed Volume is 869,000 Duration Bound is 91											
	Qp: 24,700 cfs with Average Frequency 1 per 2 years Regressed Volume is 406,000 Duration Bound is 64											
	Qp: 16,600 cfs with Average Frequency 1 per year Regressed Volume is 247,000 Duration Bound is 50											
High Flow Pulses	Qp: 4,610 cfs with Average Frequency 1 per season Regressed Volume is 55,300 Duration Bound is 26			Qp: 8,870 cfs with Average Frequency 1 per season Regressed Volume is 110,000 Duration Bound is 32			Qp: 2,110 cfs with Average Frequency 1 per season Regressed Volume is 19,300 Duration Bound is 17			Qp: 5,200 cfs with Average Frequency 1 per season Regressed Volume is 54,700 Duration Bound is 23		
	Qp: 1,610 cfs with Average Frequency 2 per season Regressed Volume is 14,100 Duration Bound is 13			Qp: 3,370 cfs with Average Frequency 2 per season Regressed Volume is 31,800 Duration Bound is 18			Qp: 1,050 cfs with Average Frequency 2 per season Regressed Volume is 8,300 Duration Bound is 12			Qp: 1,730 cfs with Average Frequency 2 per season Regressed Volume is 14,100 Duration Bound is 13		
Base Flows (cfs)	980			940			800					
				680			600			870		
				410			390					
Subsistence Flows (cfs)	130			120			130			86		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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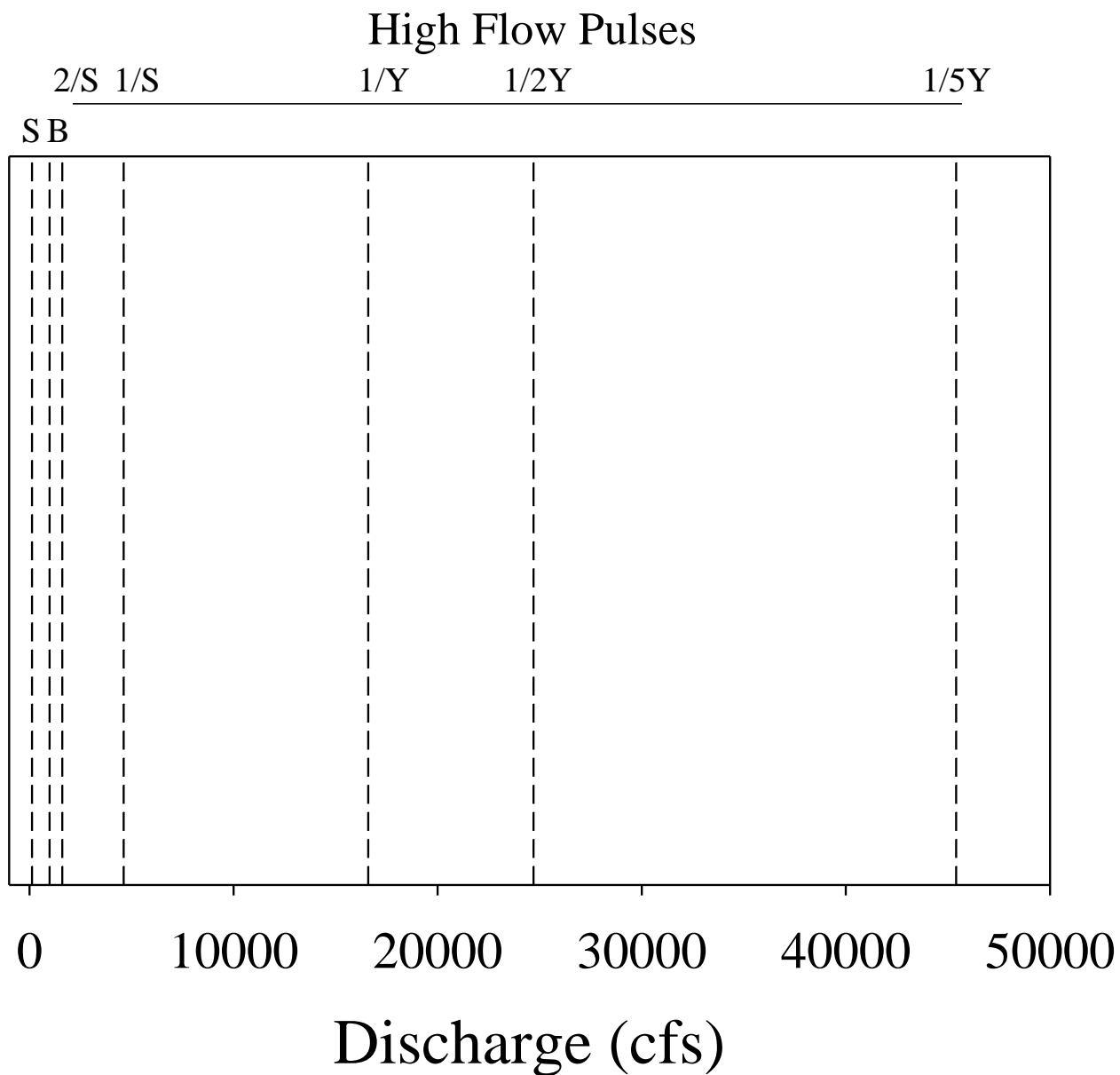
*A more direct route to solving the problem

E-Flow Regime Recommendations

- Each number (i.e., 130 cfs for subsistence flows) represents a hypothesis (prediction).
- Prediction: Subsistence flows (130 cfs; median of the lowest 10% of base flows) are sufficient to provide aquatic habitat, longitudinal connectivity, dissolved oxygen, and temperature
- Validate/test this prediction (and all others), then refine with new knowledge

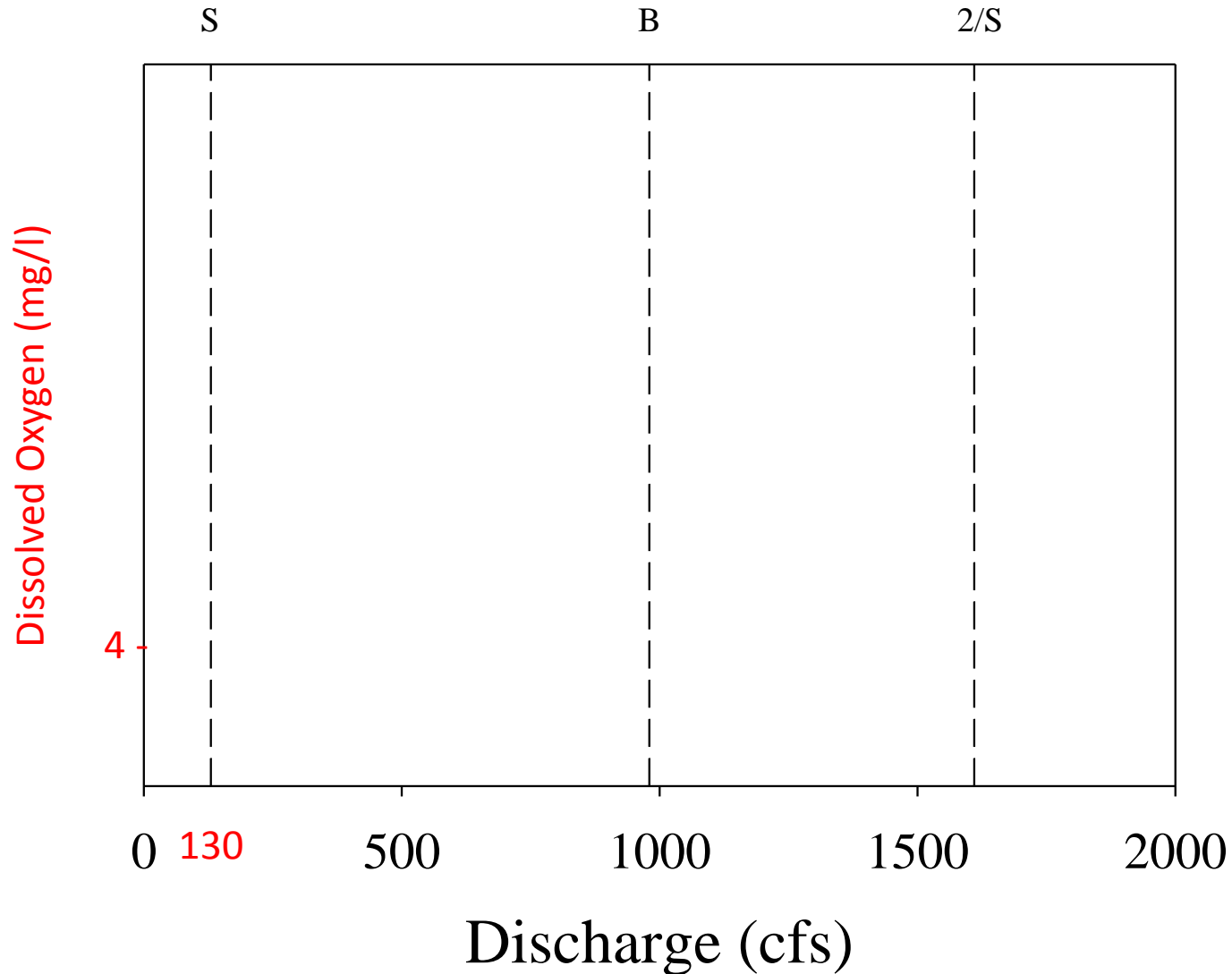
**Table 4.1-15. GSA BBASC Environmental Flow Regime
Recommendation - Guadalupe River at Cuero⁴⁹**

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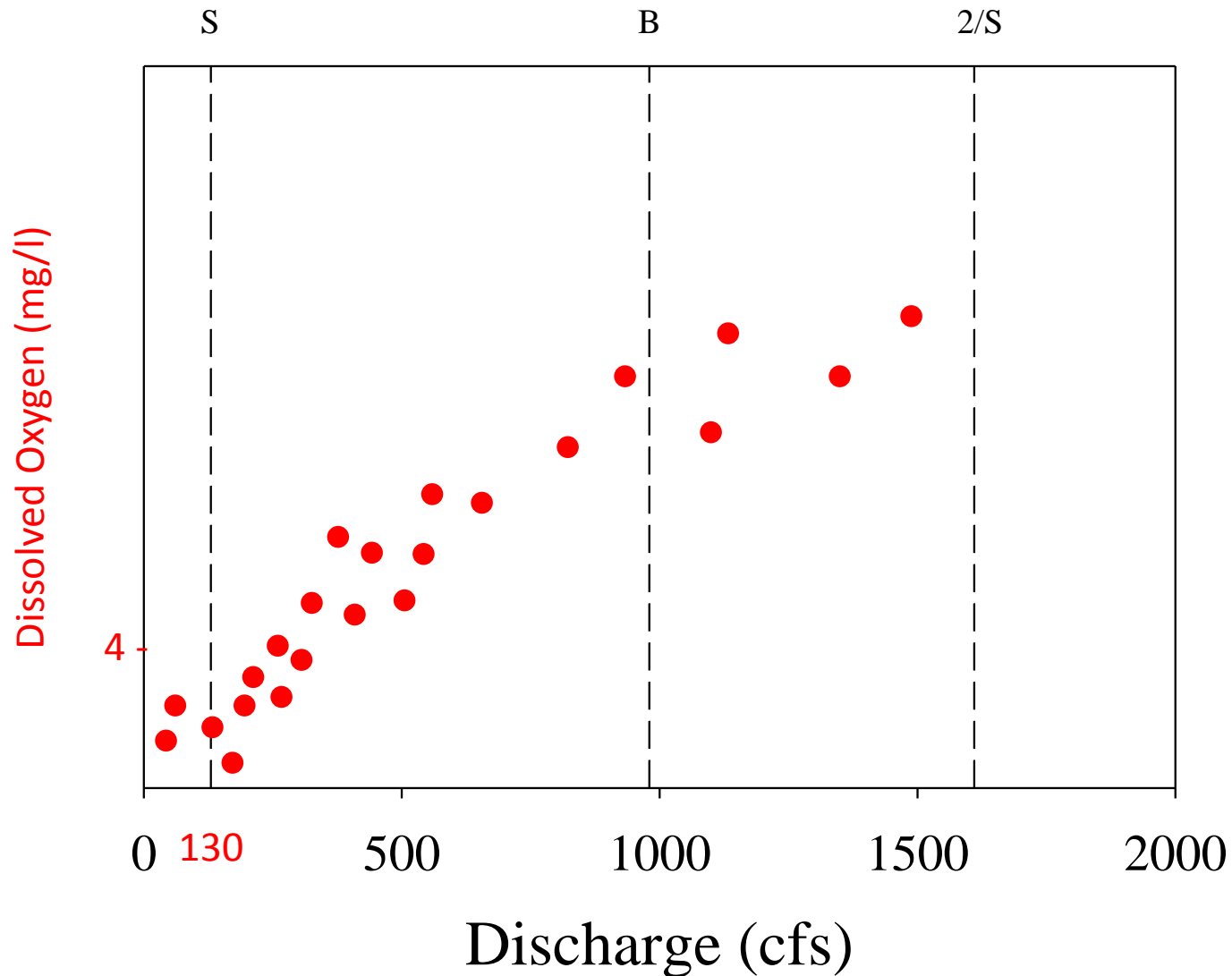


Guadalupe River at Cuero

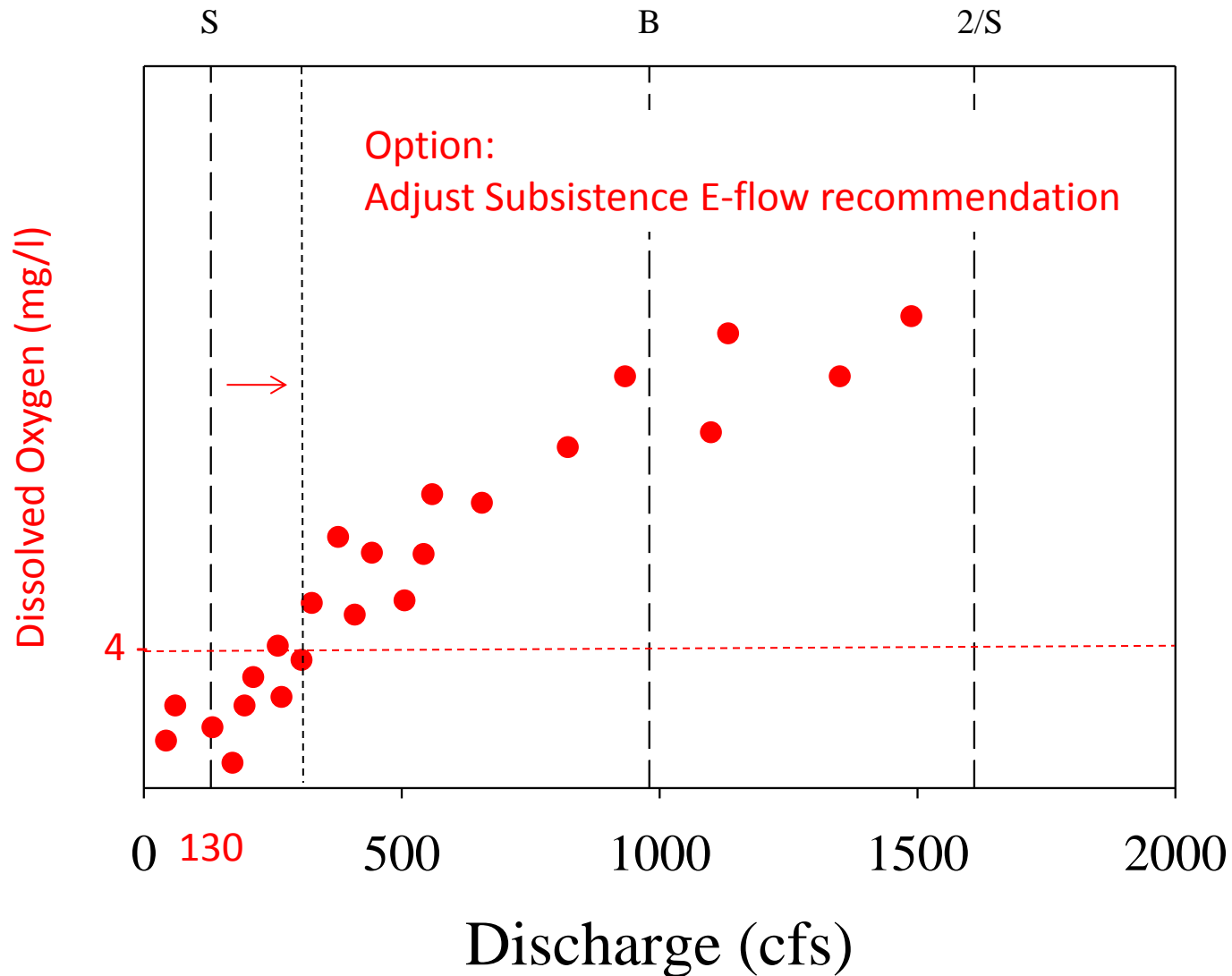
Subsistence flow (130 cfs) is sufficient to maintain dissolved oxygen levels (> 4 mg/l) for aquatic biota



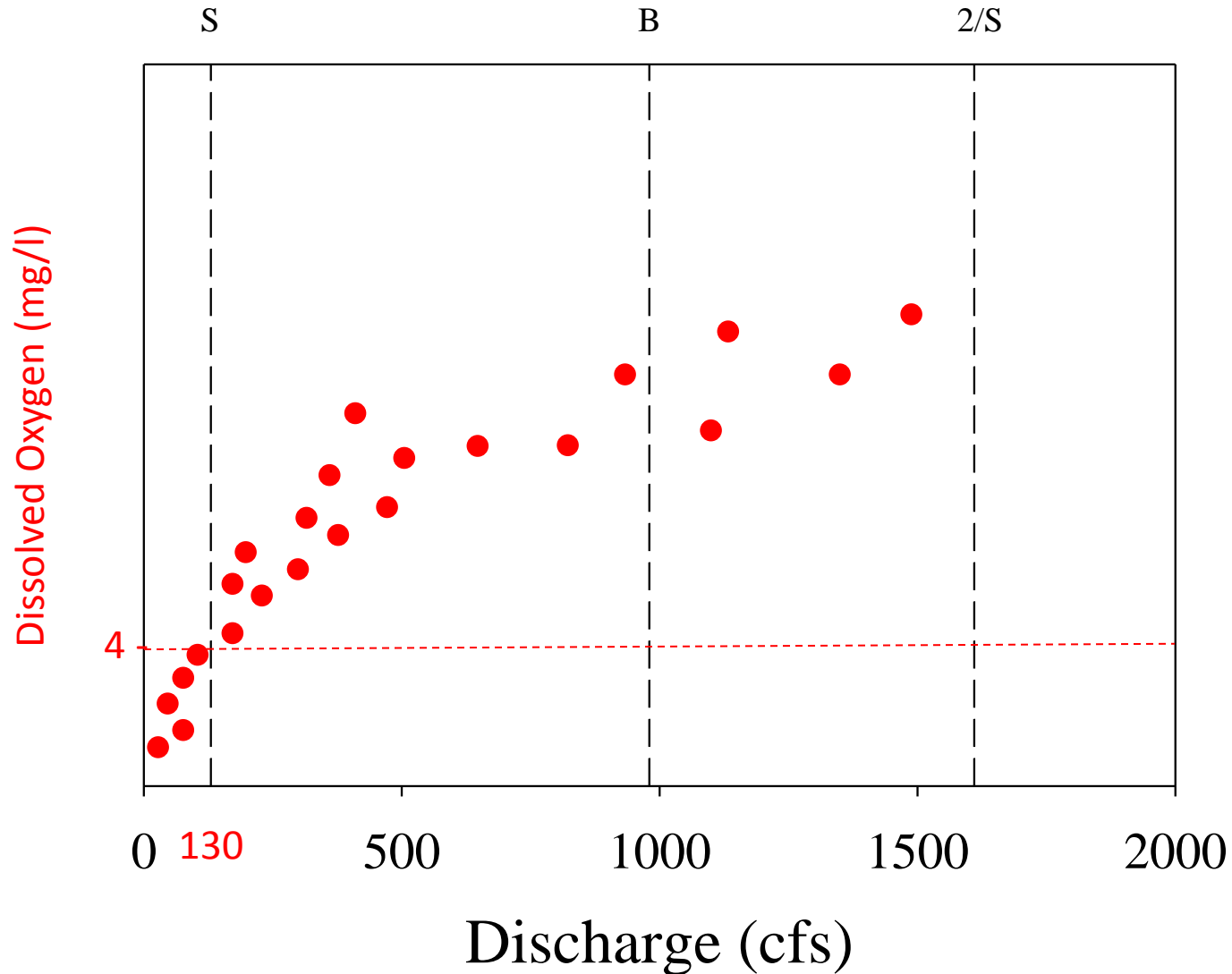
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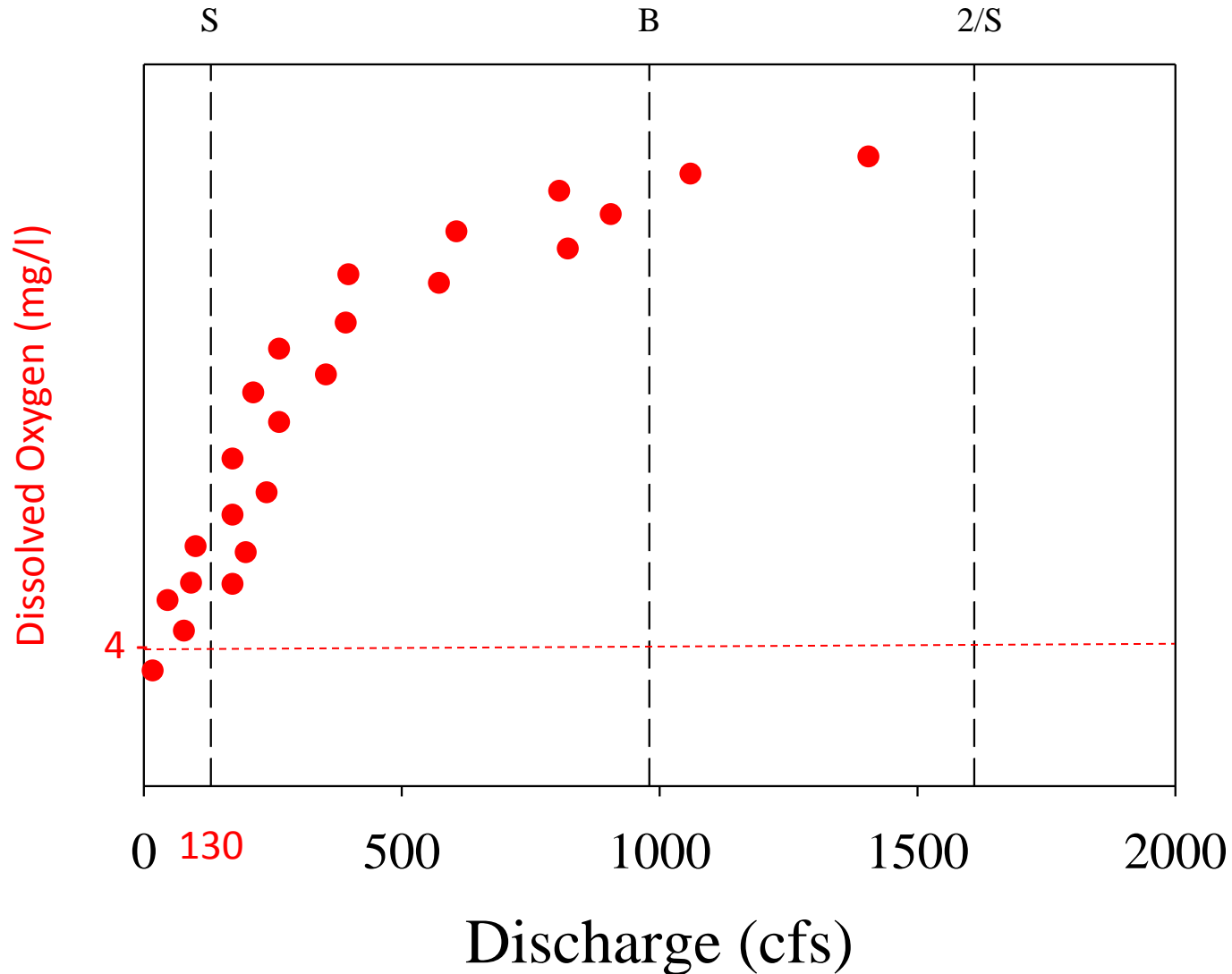
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Review

- E-flow recommendations will maintain a sound ecological environment
- Subsistence flow (130 cfs) is sufficient to maintain water quality (Dissolved Oxygen is just one parameter)
- Options:
 1. Reject and adjust (refinement)
 2. Can't reject the prediction (validation)

...for continuing the validation or refinement of the e-flow regime recommendation

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Work Plan Items

Approach 1 or 2

- SB2/TIFP on Guadalupe
 - Output: a set of e-flow recommendations, similar to BBASC/BBEST numbers
 - SB 2, like BBASC, is a hypothesis generating exercise.
 - SB 2 still needs validation (hypothesis testing exercise).
 - Which is better? Do not know until numbers are validated
 - Not a refinement or validation of E-flow recommendation

Work Plan Items

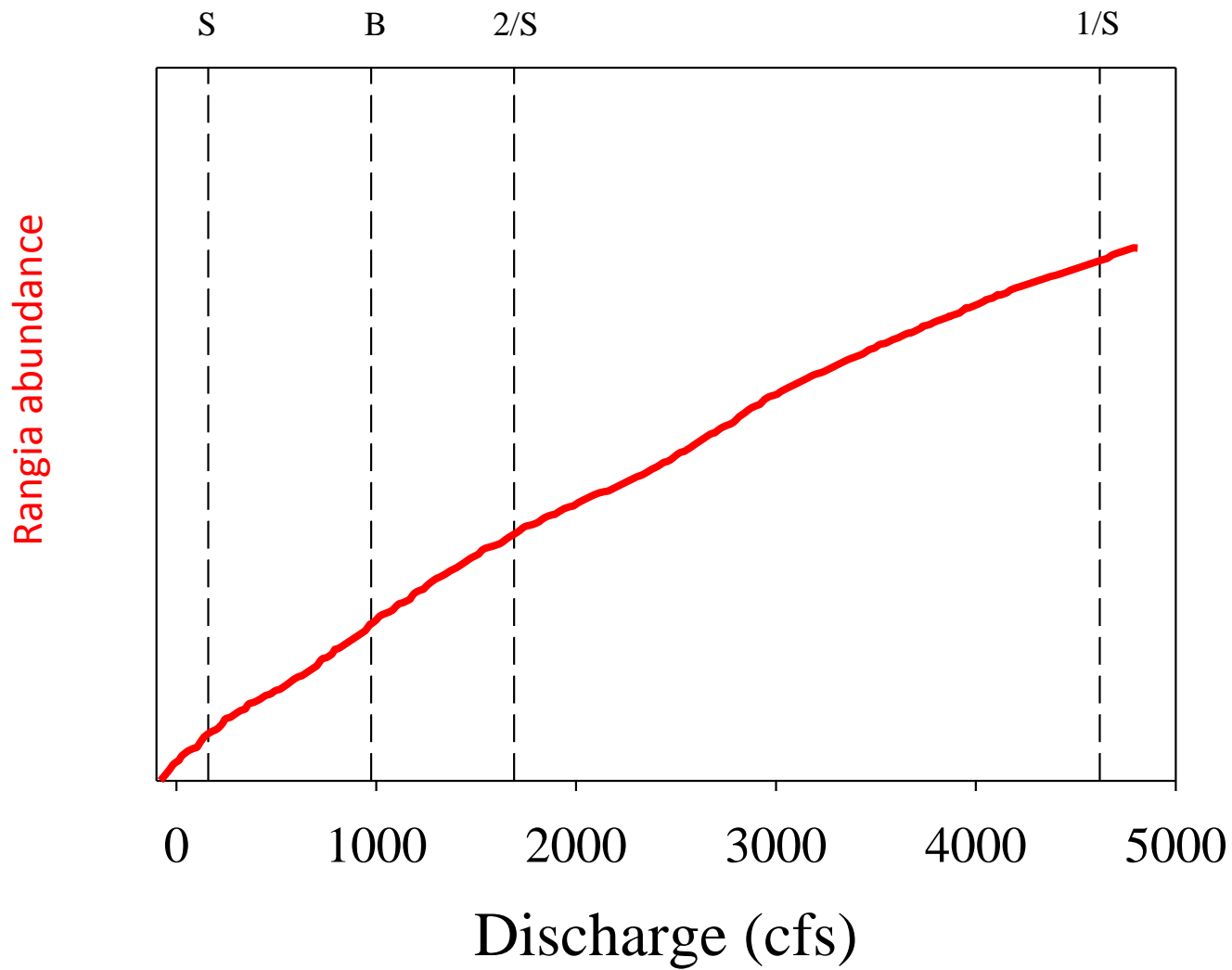
Approach 1 or 2

- **Streamflow Gaging and Synoptic Flow Study**
 - Output: increase monitoring capabilities
 - Adequate infrastructure is necessary but not a refinement or validation of E-flow recommendation
 - Request additional needs to assist with refinement and validation.

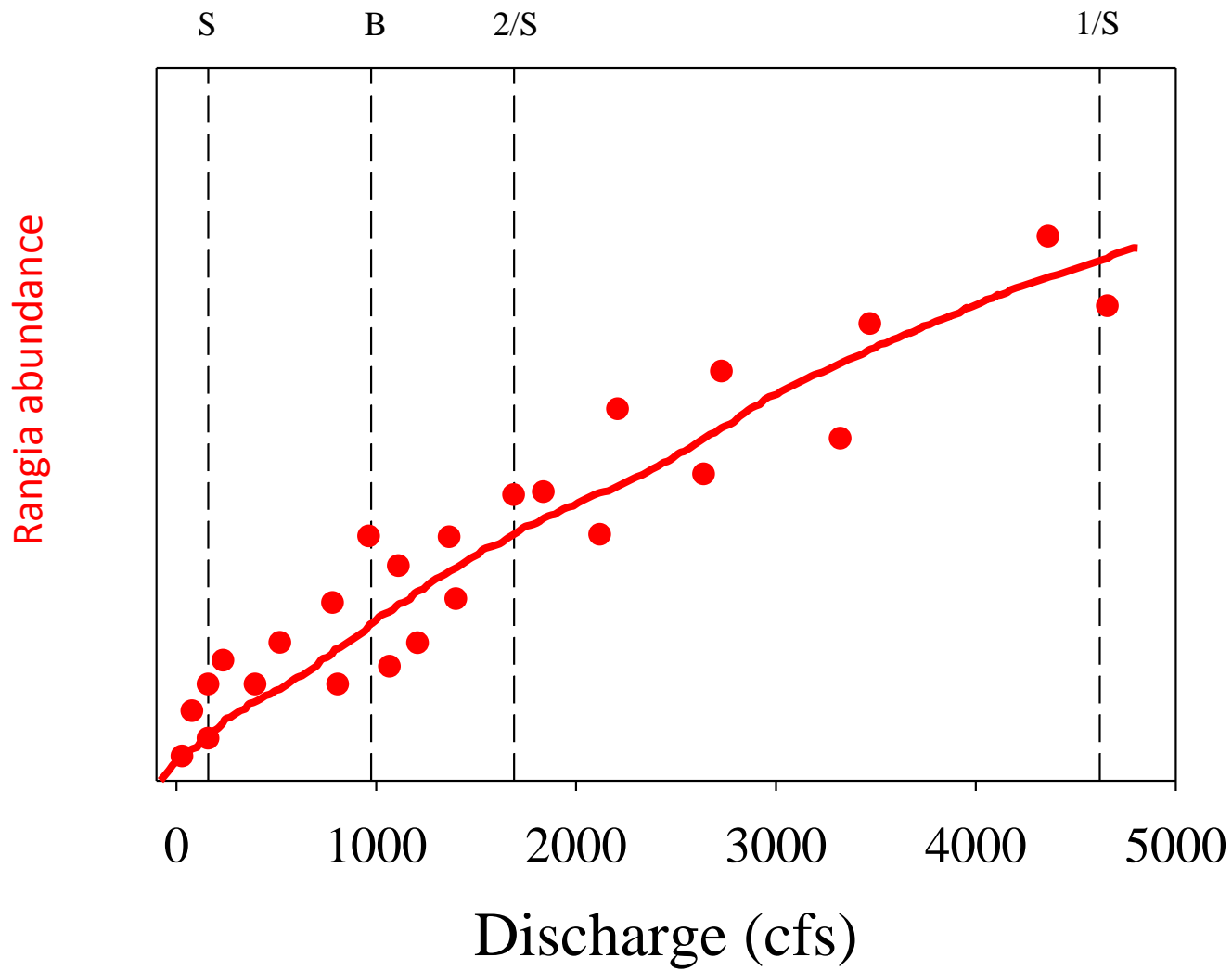
Work Plan Items

Approach 1 or 2

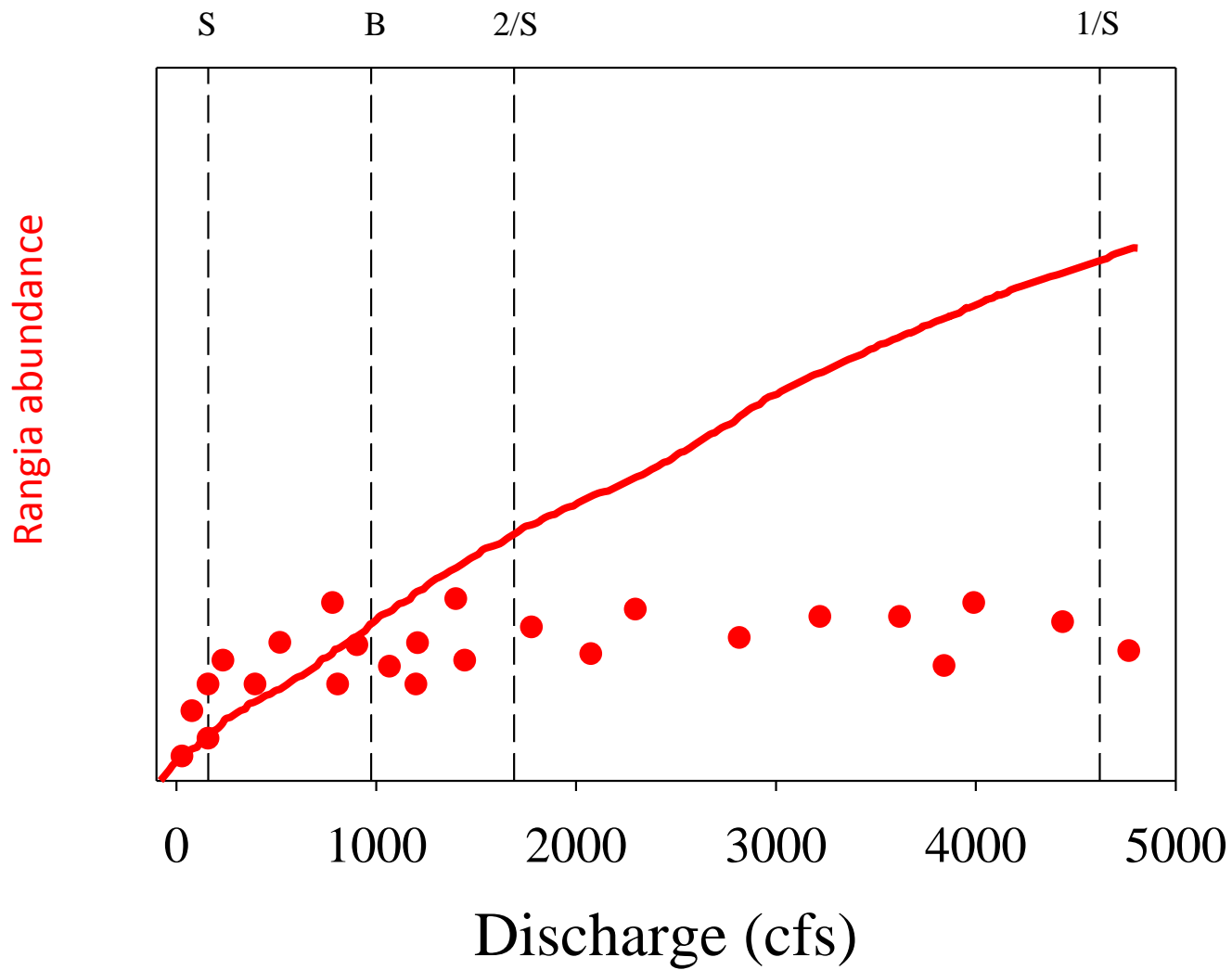
- ***Rangia* Clam Investigations**
 - Output: quantify reproduction, distribution, and abundances
 - Approach 1?
 - Convert to Approach 2.



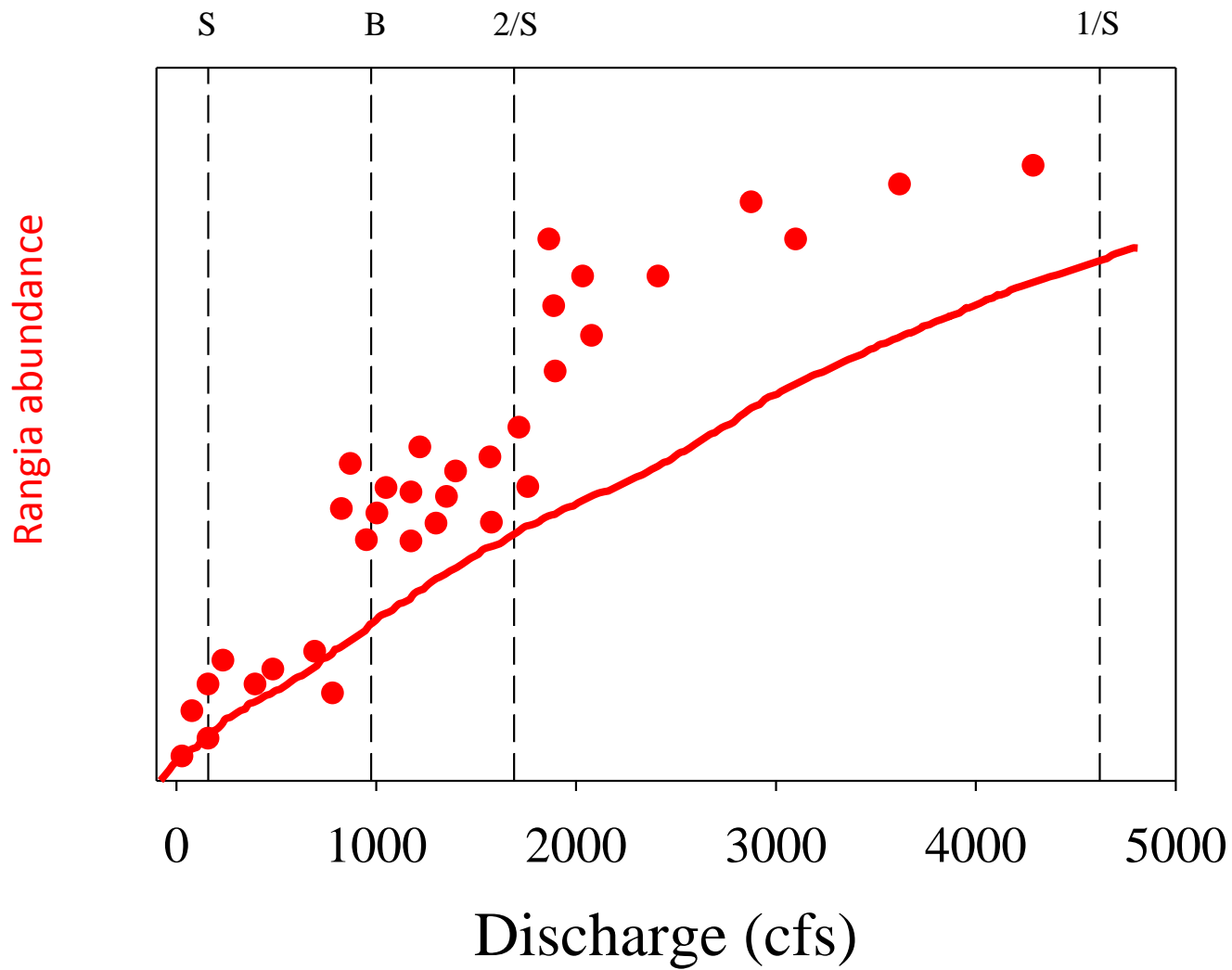
Guadalupe River at Victoria



Guadalupe River at Victoria



Guadalupe River at Victoria



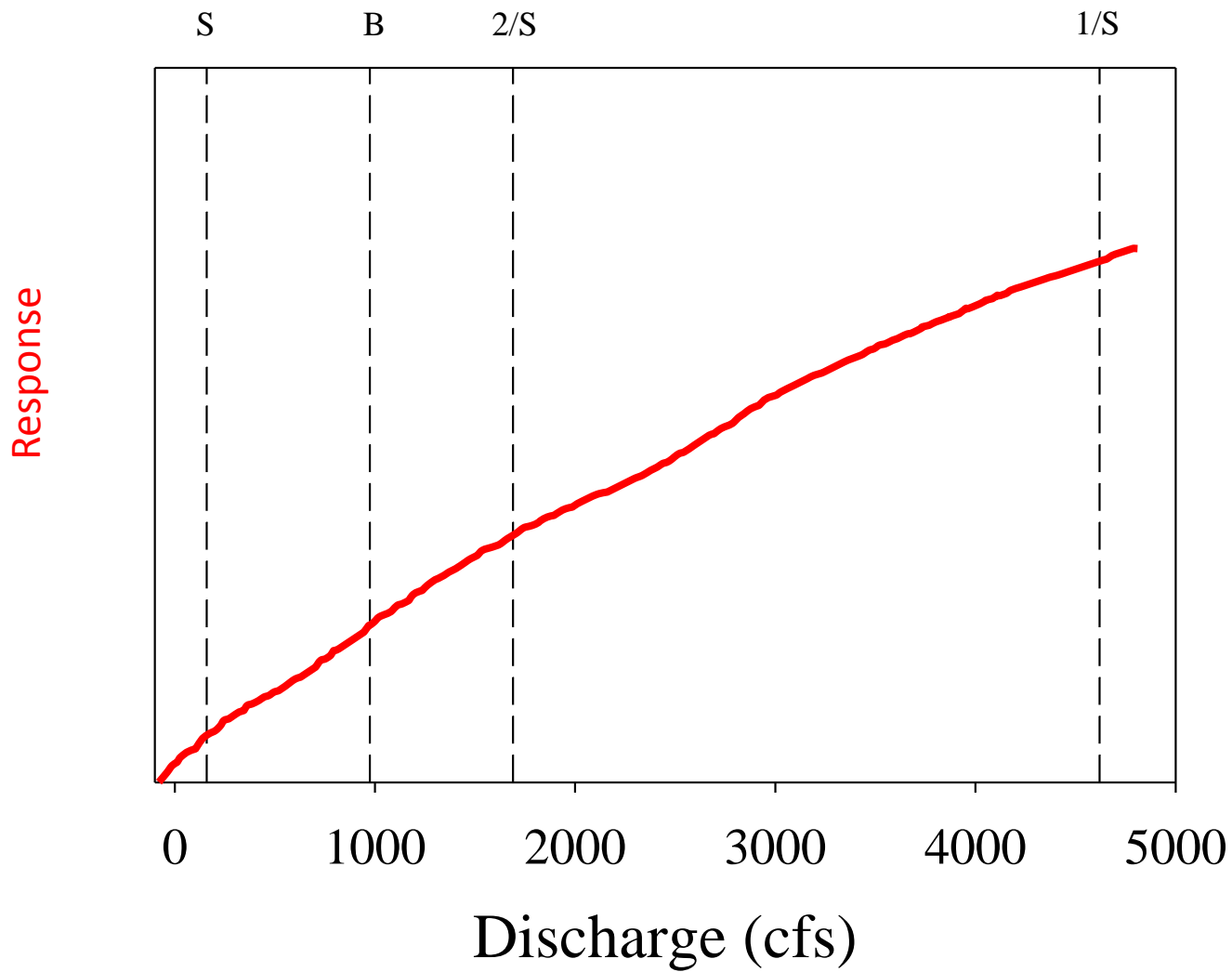
Guadalupe River at Victoria

Work Plan Items

Approach 1 or 2

- ***Rangia* Clam Investigations**
 - Output: quantify reproduction, distribution, and abundances
 - Approach 1?
 - Convert to Approach: quantify reproduction, distribution, and abundances relative to E-Flows

BBASC Tier 1 Work Plan Recommendations			
Priority	Pg #	Study Name	Notes
1	10	Instream Flows - SB2 TIFP Guadalupe Study	
2	13	Instream Flows - Streamflow Gaging and Synoptic Flow Study	
2a	13	USGS Streamflow Gaging and Water Quality Monitoring	The gage location below Victoria is dependent upon the Synoptic Flow Study (2b)
2b	15	Synoptic Flow Measurements to Estimate Freshwater Inflow and Applicability of Lower River Gaging Stations	
3	16	Bays & Estuaries - <i>Rangia</i> Clam Investigations	
4	17	Bays & Estuaries - Life Cycle Habitat & Salinity Studies for Key Faunal Species	
5	19	Bays & Estuaries - Hydrodynamic & Salinity Model Improvements	Hydrodynamic & Salinity Model Improvements Study is dependent upon Synoptic Flow Study (2b)
6	20	Instream Flows - Full Accounting of Surface Water	
BBASC Tier 2 Work Plan Recommendations			
*Disclaimer: Studies listed are grouped by type of study, not in any prioritized order			
	Pg #		
	23	Instream Flows - Riparian Assessment and Monitoring	
	25	Instream Flows - Biological Sampling and Monitoring	
	27	Instream Flows - Geomorphic Studies and Monitoring	
	31	Bays & Estuaries - The Distribution and Abundance of Marsh Vegetation in Relation to Salinity and Elevation in the Guadalupe Estuary Delta	
	33	Bays & Estuaries - Habitat Suitability Models for Eastern Oysters, Blue Crabs & White Shrimp	
	34	Bays & Estuaries - Development of an Inundation and Salinity Model of the Guadalupe Estuary Lower Delta and Adjacent Bays	
BBASC Tier 3 Work Plan Recommendations			
*Disclaimer: Studies listed are grouped by type of study, not in any prioritized order			
	Pg #		
	36	Instream Flows - Groundwater Studies	
	38	Instream Flows - Water Quality Monitoring	
	41	Instream Flows - Invasives	
	42	Bays & Estuaries - Nutrient Load & Concentration Monitoring	
	43	Bays & Estuaries - Role of Cedar Bayou in the Exchange of Water and Meroplankton to the Guadalupe Estuary	
	44	Bays & Estuaries - Evaluation of Sediment Transport Affecting the Guadalupe Estuary Delta	
	46	Bays & Estuaries - Sea Level Rise Associated with Climate Change	



Guadalupe River at Victoria

